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AUTHOR Schalago-Schirm, Cynthia
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ABSTRACT

Eighth-grade students in New Jersey take the Early Warning Test (EWT), which involves reading, writing, and mathematics. Students with EWT scores below the state level of competency take a remedial mathematics course that provides students with computer-assisted instruction (2 days per week) as well as regular classroom instruction (3 days per week). The study was conducted using 73 ninth-grade students enrolled in the Kearny High School remedial course. The computer instruction provided is specifically designed to help students attain proficiency on the mathematics portion of a state-mandated high school proficiency exam. The students were retested with the "New Jersey Special Edition EWT-Grade 9" after 6 months of remediation, and the sample mean score (March 1994) was compared with the sample mean score (March 1993). Results indicated a statistically significant gain but more than 50% of the sample still needed further remediation. (Contains 26 references.) (MLB)

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Does the Computer-Assisted Remedial Mathematics Program at Kearny High School lead to improved scores on the N.J. Early Warning Test?

by

Cynthia Schalago-Schirm

accepted 3/27/95

In partial fulfillment of the Requirements for the
Masters of Arts Degree
Kean College of New Jersey
April, 1995

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ABSTRACT

The purpose of this study was to determine if the computer-assisted remediation course at Kearny High school resulted in higher scores on the New Jersey Early Warning Test.

Current research shows that computer-assisted instruction in various subject areas and various age groups can have very positive results. The EWT mathematics course at Kearny High school provides students with computer-assisted instruction as well as teacher-aided classroom preparation.

The study was conducted using ninth grade students. After being enrolled in the computer-assisted instruction remediation mathematics course for the fall and spring semesters,their scores were compared to their performance on the "Special Edition EWT" test given in the Spring of the following year.

Results, using the "t" test, showed a gain that was quite significant. The null hypothesis of no difference was rejected.

The study showed that the computer-assisted mathematics course offered at Kearny High school did lead to significantly higher math scores on the New Jersey Early Warning Test.

ACKNOWLEDGEMENTS

Special thanks and recognition must be given to my wonderful husband, Matt, who gave me constant strength and encouragement to the bitter end.

This paper was written in loving memory of my beloved Grandmother, Eleanor,who always believed that "her granddaughter could do anything she put her mind to"!

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In 1988, The New Jersey Legislature passed a law which moved the High School Proficiency test to the eleventh grade from grade nine. The Grade 11 HSPT will serve as a graduation requirement for all New Jersey public school students who enter the ninth grade or adult high school on or after September 1, 1991. The Grade 8 Early Warning Test was established to help students prepare for the Grade 11 HSPT. The EWT is administered to all eighth-grade students in reading, writing and mathematics. "The EWT is to be used as a primary indicator for determining those students who may need instructional intervention" in the above mentioned areas.(N.J. Dept. of Ed., 1994) In the "Cycle I School and District Guidelines" for the 1994 EWT test, the manual explains the three proficiency levels. The scores of students "who are included in the highest level (Level I) are indicative of a clearly competent level of performance of the skills all students need to function politically, economically, and socially in a democratic society, referred to as the target skills." The scores of students in the middle level (Level II) are indicative of a minimal competency level and these students may be in

need of instruction. It is the individual school district who makes a decision as to the course of studies for these students. The scores of students who fall into the last level (Level III) are considered to be below the state level of competency. "These students must be provided with an individual comprehensive assessment (N.J.A.C. 6:8-6.1) and provided appropiate instructional services in the area(s) in which they have deficiencies. (See Appendix A)

Each school district must decide the most appropiate means of instruction for these students. Their deficiencies must be remediated. "Remediation should be in direct response to diagnostic findings, necessitating the use of the most suitable educational techniques as solutions to the diagnostic findings."(Wilson, 1985) In the Kearny School district, the remediation course for the EWT test in mathematics is the "Applications of High School Mathematics". Incorporated in this course is computer-assisted instruction as well as individual classroom teaching. Students receive eighty (80) minutes hands-on computer instruction combined with classroom instruction of three days weekly.

The computer instruction is provided by the Computer

Curriculum Corporation of New Jersey. There are various programs with a large range of mathematics skills as well as a specific course based on previous due-notice EWT tests. Questions about the value of such programs arise. Does the computer-assisted instruction help to build strength in the areas of the student's deficiencies? "Microprocessor programs should do more than provide an enjoyable time for the students. These programs should meet educational objectives. Some programs consist of nothing more than workbook pages adapted for the computer" (Wilson, 1985)

HYPOTHESIS

It was hypothesized that the computer-assisted instruction EWT mathematics course would not help to remediate student's deficiencies. To determine whether the materials are of value a variety of questions will be studied. Does the microprocessor just provide enjoyment and a novelty for the student? Can a student's competency level be improved by a course that combines individual instruction in a classroom as well as by a computer?

PROCEDURES

The sample of students in the study were taken from

the Class of 1997 at Kearny High School, which is a multi-ethnic school located in an urban community in northern New Jersey. There were 73 students in the experimental sample. The group of students in the sample were enrolled in the "Application of High School Mathematics" course, with various instructors.

The course consisted of individual-classroom instruction, three periods, one hundred twenty minutes weekly; as well as two periods of computer-assisted instruction, eighty minutes. The program follows a Lab-based microcomputer use: computer specialist and teacher cooperation."Applications of High School Mathematics" is offered as a fall/spring semester course.

Students were adminstered the Early Warning Test in March of 1993, as eighth grade students. Students were officially retested with the "New Jersey Special Edition Early Warning Test- Grade 9" administered in March, 1994. The scores given in the research are the raw scores. No scaled scores were reported.

Early Warning Test Data Source

The Early Warning Test is to be used as a primary indicator for determining those students who may need instructional intervention. The EWT Mathematics section

included questions to test students knowledge of numerical operations, measurement and geometry, patterns and relationships, data analysis, and pre-algebra. The test is comprised of multiple choice questions as well as open-ended questions, in which the students must give their reasoning in writing for their answer.

Applications of High School Mathematics

The remediation course for the EWT test at the ninth-grade level consists of classroom preparation as well as computer-assisted instruction. The classroom preparation consists of various lessons of the skills in the five clusters covered on the EWT test and test taking strategies for the students. Teachers try to individualize as much as possible to concentrate on the student's weaknesses.

Computer-assisted software is provided by Instructional Systems, Incorporated in Hackensack, New Jersey. Their program is designed specifically to help students attain the level of proficiency needed. Following the same format as the Early Warning Test, ISI's program provides sequential experiences in the content areas covered by the test. Each of the five clusters in mathematics is covered. Students go through

the diagnostic placement test which provides a way to establish an appropiate course level for each student beyond the initial starting level selected when the student is entered. The diagnostic placement quickly adjusts the level that the student is entered at:levels higher or lower by their demonstrated abilities. The diagnostic placement takes place the first 100 minutes that the student is "on" the computer. This course assures individualized instruction for each student. The program selects the appropiate skill areas according to the student's overall functioning level. Then, it selects the level within that skill area according to the student's performance in that strand. Management reports allows the teacher to monitor a student's progress, and when necessary, to adjust instructional strategies to meet the current needs of the student.

A comparison of the mean score for the sample on the Early Warning Test administered in the eighth grade with the mean score for the sample on the Special Edition EWT test, following six months of remediation was made to determine gains, if any. "T" tests were used to determine the significance of differences between the means.

RESULTS

Table I below shows the results of the pretest and

Table I

Means, Standard Deviations and "t"

of the Pre and Post-test Results

	M	SD	t
Pretest	28.81	5.56	8.61
Posttest	38.29	7.58	

sig < .01

posttest scores of the students on the Early Warning test. The "t" test was used to determine the significant difference between the two independent sample means. The "t" of 8.61 indicates that the difference between the means was significant.

CONCLUSIONS

As has been noted, the difference between the means, of nine (9) plus points was significant. Therefore, the

hypothesis that there would be no difference in achievement on the Early Warning Test as result of instruction is rejected. Using computer-assisted intruction in the remedial classes helps to improve student's performance on the EWT test. Further research needs to be conducted to determine effects of computer-assisted instruction and individual classroom instruction separately: CAI may add, or subtract, from individual classroom instruction. The present study does not determine that value. The gain in raw score points being statistically significant suggests that a portion of the sample has improved their skills as a result of instruction. Whether this gain is of educational significance is of first importance since pupils can be denied a diploma for not meeting the passing score. It would appear that at least fifty (50) percent of the sample are still achieving at a low point and need further remediation. Therefore, it can be concluded that the "Applications of High School Mathematics" course is only partially successful.

Mathematics and Computer-Assisted Instruction: Related Literature

The National Council of Teachers of Mathematics in 1987 stated that "Teachers should use computers as tools to assist students with the exploration and discovery of concepts, with the transistion from concrete experiences to abstract mathematical ideas, with the practice of skills, and with the process of problem solving. In mathematics education computers must be instructional aids, not the object of instruction. Teachers should take full advantage of the unique power of the computer as a tool for learning and teaching mathematics."(NTCM, 1987) The NTCM has recognized the need for utilizing technology in mathematics courses. Many school districts have implemented computer-assisted instruction in their remedial programs, at the elementary, high school and college levels. "Hands-on computer assisted approach offers an alternative to 'more of the same' which has not worked in the past" (Divine,1990) Divine in a proactive program "Prevention/Rehabilitation" tried to address the needs of high-risk high school students with computers.The computers allowed "the teacher a way to 'zero in' immediately on the needs of students and to employ positive means for engaging those students."

(Divine, 1990)

Several studies discuss these positive and negative "means" of computer-assisted instruction. Recommendations and possibilities of utilizing integrated learning systems in remedial mathematics programs along with factors for implementation are discussed. In this section, information from these various evaluations relevant to the study will be reviewed.

In the book, Computer-Based Integrated Learning Systems, Bailey describes four basic factors that facilitate the implementation of computer-assisted instruction in classrooms. For a program to have a desired effect: students must spend adequate time on the system, teachers must be involved in the students performance, the computer program must be integrated into the curriculum, and finally the program must consist of staff development. (Bailey, 1993)

Similiarly, in an article in Electronic Learning, Sivin-Kachala and Bialo suggest specific characteristics that help to maximize the benefits of educational technology: extensive teacher training to integrate the use of technology into the curriculum. There must be careful planning on the part of the teacher. The teacher

must be involved in the students performance as well as giving students opportunities for self-directed learning activities.

In that same article, two recent analyses of over 250 studies estimated that computer-based instruction is approximately 30 percent more effective in raising student achievement that instruction without computers. They describe studies in Head-Start programs as well as inner-city upper grade students in remedial programs.

A study was conducted by the U.S. Coast Guard after it was faced with a serious problem. They needed to improve the math and reading abilities of the majority of the new recruits as the entry level pool consisted of young adults with test scores below the 35th percentile. They maintained existing materials and made minor modifications to the existing mathematics curriculum to defray costs. As a result of previous experiences,they decided to implement the Control Data Corporation's computer-assisted instruction system. Students would receive instruction, drill, practice, review, and competency-based testing for math skills usually acquired in grades three to ten.

Many conclusions were made as a result of this

study. Most importantly, the CAI was used to "reinforce" classroom instruction. Having students work at the terminal before classroom instruction only confuses them.

Specific advantages were listed:

1. Supervision by staff is reduced.
2. Students work individually on assigned lessons.
3. Student feedback is immediate.
4. Record keeping is readily available for each student, freeing the instructor from repetitive administrative details.
5. Adjunct material can be individually assigned.

The program showed overall improvement of scores as well as job performance. They could not say "that any approach to basic skills training is best; the needs of the target population and the nature of the organization must be considered in the curriculum design process". The Coast Guard did feel that the computer assisted instruction "enabled the recruits to gain self-esteem and self confidence". (Glidden,1984) They produced motivated, dedicated and qualified enlisted members.

In an evaluation report of the Portland Public Schools done by Adams and Morgan, another important

consideration of computer-assisted programs was discussed. The course content of the CAI programs must match the goals of the current curriculum." Using the Portland Achievement Level Tests for evaluation, we needed to determine the relationship between the supplemental CAI instruction and the testing instrument." In other words, the curriculum of the computer-assisted instruction must be aligned to the curriculum followed for achievement on standardized tests. If a teacher elects to teach topics or utilize the computers for subject matter not included on standardized test used, there are two probable consequences. "First, the student performance on the test will not reflect the level of learning of that topic. Secondly, the amount of instructional time spent on the untested topic may reduce the instructional time spent on the topics tested." (Freeman, 1982)

In the report Computer Use in the Portland Public Schools computer-aided learning programs did not show significant difference in achievement gains in mathematics. A strong recommendation was made though "to determine how best to assist teachers to change instructional practices to make use of the best features

of computer-assisted learning". Teachers need to be in-serviced for the program to be effective. "It is evident that other software instructional activities, and other scheduling patterns than those used should be tried under carefully-controlled conditions." (Adams, 1983)

Similiar results yielded a study by Cosden and Abernathy to clarify teacher roles in relation to instruction utilizing computers in remedial classrooms. Of the four basic microcomputer instruction types; classroom-based microcomputer use, Lab-based microcomputer use:teacher supervised, Lab-based microcomputer instruction:computer specialist supervised,the last type, Lab-based microcomputer Use:computer specialist and teacher cooperation, seems to be the most beneficial."The teacher does not need to gain mechanical expertise in the use of the hardware and software;concurrently, the technician is able to rely on the teacher for skills in curriculum planning and to meet specific students educational needs".(Cosden,1990)

According to Andrew J. Jenkins, in an evaluative report, Chapter One Resource Laboratory Program for Computer Assisted Instruction in 1990, there was a significant net gain for students enrolled in a Chapter

One remedial mathematics computer-learning program. His determination was based on a study of 743 students in the District of Columbia. Students were pre-tested and post-tested with the Comprehensive Test of Basic Skills. A "tripod method" program utilizing a pull-out procedure gave the students classroom individual and group instruction, as well as computer-assisted instruction with self-directed activities. It was stated that "the CAI intervention provides an important cornerstone of program services for these Chapter 1 students."(Jenkins, 1990)

Marked gains was also evident in a study done to evaluate the effectiveness of microcomputer-based math assessment. With as little as twenty-five minutes weekly, mildly handicapped students "demonstrated marked gains in the areas of math remediation individualized for their specific skill deficit areas." (Haus, 1983) The program included initial and ongoing assessment of student performance. Similiar results were found in A Quantitative Synthesis of Research Findings Relative to the Pedogical Effectiveness of Computer-Assisted Mathematics instruction in Elementary and Secondary Schools. Having a much larger control group,"CAI programs

were significantly more effective in promoting increased student achievement among highly achieving and disadvantaged students, although the average level students were not enhanced by supplementary drill/practice computer-assisted instruction." (Burns,1981) The research did make an interesting finding in that "CAI was significantly more effective in stimulating greater achievement gains among boys at the intermediate level." (Burns, 1981)

Many school districts feel that the most positive aspect of computer-assisted instruction is the motivation level of the students. Dr. Seymour at the Department of Educational Technology gave clear results of hundreds of fifth and sixth grade students. If given the opportunity, students chose the computer over pencil and paper classwork, tests and quizzes. Students completed more problems in a classtime and began working before the bell for class began.

Recently, many colleges have implemented remedial programs for incoming freshmen in the areas of reading, writing, and mathematics. At Miami-Dade Community college nineteen percent of the 13,406 of those enrolled in the fall of 1991 were taking reading, 20 per cent taking

writing, and 34 per cent were taking mathematics. To deal with the widespread problem, faculty members were experimenting with computer-assisted instruction in the basic skill areas. The venture called "Project Synergy", was implemented to help under prepared students overcome their deficiencies and complete a college education. At this level, results from such a program was quite encouraging. All the students were tested before and after their courses. The scores showed improvement as well as a lower drop-out rate for students. In one particular instance, a student took eight hours to complete a particular skill. "With the computer he felt comfortable. People would not have had that much patience with his deficiency" and the student was not embarassed by his struggle. (Watkins, 1991)

Particularly with adolescents, the opportunity to get help from a machine, rather than be embarassed by asking for help publicly in class seems,very desirable" claims Wiburg in the Computing Teacher.High school students express pleasure at the relative "independence" from adult control when working with the computer.
Quite interesting though, over 70% of the students preferred to get explanations from the teachers, since

the teacher can give information specific to them as an individual.

Many of the above studies involved various types of microcomputers as well as multiple types of software. Some research has been done with the Computer Curriculum Corporation. Using specific microcomputers and CCC software, the Association for Supervisors and Curriculum Development found that the time children spent at CAI terminals was positively related to achievement. "Fifteen hundred minutes per school year is the optimum time students should spend on CAI where CAI is used to supplement instruction." (ASCD,1981)

One research study compared two computer assisted instruction management systems in remedial mathematics. The Computer Curriculum Corporation was the preference for the faculty of the Bryan Independent school district due to the management ease. Teachers are able to access reports on the students deficiencies. Gains reports allow the teacher to see how much improvement the child has made at his or her level of achievement. This particular microcomputer program was the most cost effective for the school district.

Some school districts have employed the help of

outside companies to help meet individual learning needs for all students. Education Alternatives, Inc. attempts to individualize instruction in the South Pointe Elementary School in Miami Beach, Florida. The company applies what it calls the "Tesseract philosphy: All children are talented and can learn, but not at the same pace or in the same way." (Rockman,1993) In a computer classroom, the students follow a Personal Education Plan integrating math and reading programs by the Computer Curriculum Corporation to supplement classroom work. Teachers and student mentors- parents or senior citizens supply support and tutoring to individualize in the computer lab.

Most of the studies explained previously, indicate that computer-assisted instruction helps to improve deficiencies. A final observation of possibly "why" computer assisted instruction works,was made by David Hornbeck. "Assistance for at risk children at the elementary and secondary school levels may come through computer-assisted instruction, not only because the software addresses student needs, but also because the ability of the computer to empower students to take control of their learning. Such experiences of control

are integral to the academic success of at-risk students, many of whom feel a lack of control due to environmental, physical, mental and learning disabilities." (Hornbeck,1991)

Since 1965,"in the rhetoric of the great society, no child is left behind," has been the federal goverment's pledge to our educationally disadvantaged children, states the Chapter I of Title I of the Elementary and Secondary School Act. Chapter 1 monies are allocated to local school districts to help low-achieving poor students to receive the extra help needed to show competency. Most states evaluate this need by such high school graduation tests as the HSPT11 and the Early Warning Test. In 1992-1993, $350 million Chapter 1 dollars was spent on computers. The Department of Education spokespeople "anticipate a 'renaissance' in the use of technology to help move Chapter 1 instruction into the 21st century." Gordon Ambach, executive director of the Council of Chief State School Officers, stated that computers have most definately helped low-achieving students gain basic skills mastery. He suggests, the next step, "that technology be used in the context of problem solving and critical thinking skills

to help 'push the edge of the envelope on what Chapter 1 students can learn."

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APPENDIXES

Appendix A
New Jersey Administrative Code

Title 6: Education

SUBTITLE G — RESEARCH, PLANNING AND EVALUATION
CHAPTER 8 — THOROUGH AND EFFICIENT SYSTEM OF FREE PUBLIC SCHOOLS
SUBCHAPTER 6 — PROGRAMS AND SERVICE FOR PUPILS AT RISK

6:8-6.1 Assessment of pupil needs

Each district board of education shall annually identify those needs and conditions which place pupils at risk of not acquiring the knowledge, skills, behaviors and attitudes necessary for school success, school completion, and successful functioning as an adult in society. The assessment shall include, but not be limited to, assessments of pupil achievements as required by N.J.A.C. 6:39, and information contained in the Annual Pupil Assistance Committee Report, N.J.A.C. 6:26-4.

6:8-6.2 Programs and services for pupils at risk

(a) District boards of education shall approve a plan for utilizing at-risk aid generated by the Quality Education Act, P.L. 1990, c.52, as well as foundation aid and other State and Federal funds for programs and services for pupils at risk, by October 1 each year. The plan shall be submitted to and approved by the Department of Education in accordance with the provisions of N.J.A.C. 6:8-4.10.

(b) The plan shall specify programs and services to address the conditions which place pupils at risk, including assistance to parents and guardians in promoting school success. The plan shall be based on the assessment of pupil needs and address those needs within the framework of the following goals:

1. Prevention: To enhance the health, self-esteem and learning of life skills necessary for age-appropriate development and productive functioning in the school setting and in society;

2. Intervention: To identify and assist pupils who are not meeting standards for behavior and achievement in areas such as attendance, conduct, and mastery of the curriculum, as well as performing below State minimum levels of proficiency; and

3. Improving the learning environment: To improve the school climate so that pupils experience school as a safe, supportive and disciplined place where academic and interpersonal growth and learning can take place.

(c) For each pupil performing below State minimum levels of proficiency after completion of three academic years of instruction beyond kindergarten, the district board of education shall ensure the development, implementation and monitoring of an individual pupil improvement plan. The district board of education shall ensure that:

1. The pupil and the pupil's parent(s) or guardian(s) are informed of the need for and content of the individual pupil improvement plan in the language or mode of communication which is understood by the pupil and the parent(s) or guardian(s) in accordance with N.J.A.C. 6:3-2.2(k); and

2. Ongoing communication takes place among the regular classroom teacher, and the parent(s) or guardian(s) of the pupil for whom the plan has been developed and those responsible for providing services described in the individual pupil improvement plan.

(d) The district board of education shall provide for the staff training necessary to implement the programs and services for pupils at risk specified in the annual plan.

(e) Programs and services for pupils at risk may be offered during the regular school day, beyond the regular school day or during the summer. To the extent that such programs and services do not fall within the scope of authorized certification pursuant to N.J.A.C. 6:11, or cannot reasonably be provided except outside the school setting, such programs and services may be delivered by qualified individuals who are not necessarily certified but are supervised by appropriately certified school staff members.

6:8-6.3 Budget documentation

The district board of education shall provide documentation to the county offices of education through the annual budget process, pursuant to N.J.S.A. 18A:7D-27, in support of the annual programs and services plan developed in accordance with N.J.A.C. 6:8-6.2.

6:8-6.3 Budget documentation

The district board of education shall provide documentation to the county offices of education through the annual budget process, pursuant to N.J.S.A. 18A:7D-27, in support of the annual programs and services plan developed in accordance with N.J.A.C. 6:8-6.2.

SUBCHAPTER 7 — PROMOTION AND HIGH SCHOOL GRADUATION REQUIREMENTS AND PROCEDURES

6:8-7.1 Promotion, remediation, and graduation procedures

(a) District boards of education shall adopt policies and procedures for:

1. Pupil promotion, related to district goals, objectives, and pupil proficiency;

2. Remediation opportunities for pupils to satisfy any failed proficiencies;

3. High school graduation requirements, pursuant to law and rule, which are consistent with the achievement of State and district goals, objectives, and pupil proficiency with particular reference to reading, writing, and mathematics skills as specified in (b), (c), (d), and (e) below; and

4. The exemption of handicapped pupils from the high school graduation requirements pursuant to N.J.A.C. 6:28-3.6 and 4.4, 6:39-[illegible] and (b)6 below.

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5. Annual notification to pupils and parent(s) or guardian(s) of the policies and procedures for pupil promotion, remediation, and the high school graduation requirements;

6. Notification to each entering ninth grade pupil and his or her parent(s) or guardian(s) of all State and local high school graduation requirements. In addition, at the beginning of each course required for graduation, each district board of education shall distribute a list of proficiencies required for successful completion of that course to all pupils and their parent(s) or guardian(s). These proficiencies lists shall include, but not be limited to, the core course proficiencies identified by the Department of Education in (c)2iii below;

7. Notification to each pupil and parent(s) or guardian(s) at appropriate times during the school year of the pupil's progress in meeting the promotion, course proficiencies and the high school graduation requirements;

8. Immediate consultation, not longer that 10 school days after the local school district becomes aware of the pupil's deficiencies, with the pupil's parent(s) or guardian(s).

9. Appeal of promotion/retention decision by parent(s) or guardian(s) and adult pupils; and

10. Participation of parent(s) or guardian(s), teachers, and students, where appropriate, in the development of pupil promotion and remediation policies.

(b) District boards of education shall adopt policies and procedures for high school graduation of all pupils, pursuant to law and rule, which shall include, but not be limited to, performing at or above the State minimum levels of pupil proficiency on the State-mandated High School Proficiency Test in reading, writing, and mathematics skills.

1. Pupils in grades 9 and 10 who perform below State minimum levels of pupil proficiency on one or more areas of the State-mandated Early Warning Test and pupils in grades 11 and 12 who perform below State minimum levels of pupil proficiency on one or more areas of the State-mandated High School Proficiency Test shall be provided with an individual comprehensive assessment, as specified in N.J.A.C. 6:8-6.1. Based on the individual comprehensive assessment, the pupil shall receive the necessary services to remedy the identified deficiencies. Such services shall include, but not be limited to, the development and implementation of an Individual Student Improvement Plan. This individual plan may be carried out through the regular program or through an extended school day, extended school week, or extended school year. Comprehensive pupil assessment and re-evaluation of the individual plans shall take place at least once each year until all identified deficiencies have been remediated.

2. Each district board of education shall develop procedures for the development of Individual Student Improvement Plans. These procedures shall include, but not be limited to, those procedures set forth in N.J.A.C.6:8-6.2.

3. Pupils who perform below State levels of pupil proficiency on one or more areas of the State-mandated Early Warning Test or the High School Proficiency Test shall be provided an opportunity to demonstrate mastery in each academic year.

4. Pupils who perform below State minimum levels of pupil proficiency on one or more areas of the State-mandated High School Proficiency Test and have satisfied all other State and local graduation requirements shall be provided an additional evaluation during the twelfth year which is based on the Individual Student Improvement Plan required under (b)1 above. This evaluation, the Special Review Assessment, may include, but is not limited to:

i. Performance on State tests, including all retests;
ii. Performance on locally selected tests;
iii. Performance on course work;
iv. Practical demonstrations of specific skill mastery which occur either in or outside of school, but which are not part of regular course work;
v. Formal interview with the parent(s);
vi. Formal interview with the teaching staff;
vii. Guidance counselor and/or psychologist review, as appropriate;
viii. Visual, auditory, and/or medical data, as appropriate;
ix. Examination of credit and curriculum performance; and
x. Examination of pupil proficiencies in other areas.

5. The findings of the evaluation required in (b)4 above shall be recorded on a Special Review Assessment Student Profile Form developed by the Department of Education. An independent evaluation of these data must be made by a local district review panel comprised of at least three teaching staff members not currently instructing the pupil. On the basis of the evidence listed in (b)4 above and the recommendations of the review panel, the building principal and the chief school administrator may certify satisfactory attainment of the State minimum levels of pupil proficiency in reading, writing, and/or mathematics. Whether or not such certification occurs, the district must retain the Student Profile Form, including all attachments, for one year after the pupil's class graduates. If such certification occurs, the Special Review Assessment Student Profile Form must be forwarded to the county superintendent of schools by March 1 of the regularly scheduled graduation year. Based upon the documentation provided by the local district, the county superintendent of schools must certify whether or not the State minimum levels of pupil proficiency have been achieved and notify, in writing, the chief school administrator of this decision.

6. An educationally handicapped pupil must meet all State and local high school graduation requirements in order to receive a State-endorsed high school diploma, pursuant to the provisions established under N.J.A.C. 6:28.

i. A handicapped pupil who has not been exempted from the proficiencies or has performed below the State minimum levels of pupil proficiency on one or more areas of the State-mandated High School Proficiency Test shall participate in the Special Review Assessment.

7. All pupils of limited English proficiency must satisfy requirements for high school graduation in accordance with the provisions of this section except:

i. Pupils of limited English proficiency who enter New Jersey schools in grade nine or later may demonstrate that they have attained State minimum levels of proficiency through the Special Review Assessment in their native language, and

ii. Pupils of limited English proficiency who enter New Jersey schools in grade nine or later and who demonstrate that they have attained State minimum levels of proficiency through the Special Review Assessment in their native language must take the Maculatis Assessment Program and attain the passing level of fluency of 133 raw score points to be eligible for a State-endorsed high school diploma.

8. Any out-of-school youth or adult age 18 or older who has otherwise met all State and local graduation requirements, but has failed to pass the State-mandated High School Proficiency Test may return at times which have been scheduled and publicly announced by the district for the purpose of taking the necessary test. Upon certification of passing the test, a State-endorsed diploma will be granted by the high school of record.

c. Minimum high school graduation requirements include the following:

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1. District boards of education providing high school diplomas, in cooperation with any sending district(s), shall adopt policies and procedures for defining minimum high school curriculum requirements and locally determined proficiencies, including the Statewide core course proficiencies therein, pursuant to law and rule, which shall include, but not be limited to:

i. Requiring the successful completion of a program of study in grades nine through 12, effective with the September, 1987 grade nine class, which shall include, but not be limited to:

(1) One credit year of English for each year of enrollment, up to four credit years;

(2) Two credit years of mathematics, effective through August, 1990; three credit years of mathematics, effective with the September, 1990 grade nine class;

(3) Two credit years of social studies/United States history, as required by N.J.S.A. 18A:35-1 through August 1988, and one additional credit year of world history/cultures, effective with the September, 1988 grade nine class;

(4) One credit year of natural or physical science through August, 1989; two credit years of natural or physical science, effective with the September, 1989 grade nine class;

(5) One credit year of physical education, health and safety for each year of enrollment, as required by N.J.S.A. 18A:35-7;

(6) One credit year of fine, practical, and/or performing arts;

(7) One-half credit year of career education. This requirement may be satisfied through the alternative methods of infusion into existing courses, course equivalents, or a career education course. For credit to be awarded, career education shall be offered as a course, as specified in (c)iii below or in (d) below.

ii. Pupils may meet the curriculum requirements set forth in (c)1i above through demonstration of mastery of Statewide core and locally determined course proficiencies in each of the above curriculum areas or through program completion procedures noted in (d) below. This determination shall be made by the district board of education.

2. Pupil proficiencies in (c)1 above shall be developed as follows:

i. The Commissioner shall recommend to the State Board of Education uniform Statewide core course proficiencies for those curriculum areas mandated by the State Board for high school graduation and for foreign languages. Upon the receipt of the Commissioner's recommendation, the State Board of Education shall review and approve by resolution the core course proficiencies. The core course proficiencies shall be developed and recommended to the Commissioner through a collaborative process which shall include:

(1) Curriculum convocations,

(2) Curriculum panels, composed of outstanding educators and others; and

(3) Local school district review.

ii. Core course proficiencies shall be developed within the following timelines for the respective curriculum areas:

(1) Mathematics, beginning August 1, 1989 and concluding October 1, 1990;

(2) Natural or physical science, beginning August 1, 1989 and concluding October 1, 1990;

(3) English, beginning August 1, 1990 and concluding October 1, 1991;

(4) Social studies, beginning August 1, 1990 and concluding October 1, 1990;

(5) Foreign languages, beginning August 1, 1991 and concluding October 1, 1992;

(6) Fine, practical and/or performing arts, beginning August 1, 1992 and concluding October 1, 1993;

(7) Career education, beginning August 1, 1992 and concluding October 1, 1993; and

(8) Health, safety and physical education, beginning August 1, 1993 and concluding October 1, 1994.

iii. For each of those courses mandated by the State Board of Education, district boards of education shall establish course proficiencies, including, but not limited to, the Statewide core proficiencies in the following curriculum areas:

(1) Mathematics by September 1, 1991;

(2) Natural or physical science by September 1, 1991;

(3) English by September 1, 1992;

(4) Social studies by September 1, 1992;

(5) Foreign languages by September 1, 1993;

(6) Fine, practical, and/or performing arts by September 1, 1994;

(7) Career education by September 1, 1994; and

(8) Health, safety and physical education by September 1, 1995.

iv. District boards of education shall establish course proficiencies for each course in all curriculum areas. Upon approval of these proficiencies by the district board of education, all students shall demonstrate mastery through specified methods and instruments of assessment in all courses as a condition of graduation.

v. The Statewide core course proficiencies in the content areas set forth in (c)2ii above shall be reviewed by panels of outstanding local educators convened by the Commissioner every five years following their establishment. Based upon the recommendations of the panel, the Commissioner shall consider the revision of the core course proficiencies.

(d) Subject to approval of the State Board of Education:

1. Each district board of education shall establish graduation requirements on the basis of either course credits, program completion, or a combination of course credits and program completion.

i. Course credit requirements shall be established as follows:

(1) Each four-year high school shall establish a minimum number of not less than 92 credits to be required for graduation, effective with the September, 1987 grade nine class; not less than 110 credits effective with the September, 1988 grade nine class.

(2) Each three-year high school shall establish a minimum number of not less than 69 credits to be completed in grades 10 to 12 inclusive, effective with the September, 1987 grade 10 class; not less than 82.5 credits effective with the September, 1989 grade 10 class.

(3) Six-year schools may base their graduation requirements on formal completion of grades nine to 12 or 10 to 12 within the credit limits established for four-year or three-year high schools, respectively.

(4) Credit toward graduation shall be awarded by the following method:

(A) Credit shall be assigned on the same basis to all high school courses offered by the district board of education. One credit is awarded for a class period of instruction which meets one time per week during the school year. A class period of instruction is a minimum of 40 minutes. A credit year is awarded for a class period of instruction which meets daily for the school year and equals five credits.

(B) Credit may be assigned by each district board of education for curricular activities, as defined in N.J.A.C. 6:27-1.13.

(C) Approved cooperative education program credits shall not exceed 15 credits per year.

ii. Credit year requirements set forth in (c) above may be met in whole or in part through program completion as follows:

(1) District boards of education may determine and establish a set number of curricular activities or programs for promotion and graduation purposes.

(2) Programs shall be planned for individuals and/or a group based on specific instructional objectives.

(3) The principal shall certify completion of curricular activities or programs based upon specified instructional objectives.

(4) Group programs based on specific instructional objectives shall be approved in the same manner as other approved courses. Individual programs shall be on file in the local district and subject to review by the Commissioner or his or her designee.

2. District boards of education shall establish pupil attendance requirements appropriate to each of the particular educational programs.

(e) Successful completion of the requirements set forth in (b), (c), and (d) above and any local requirements shall be required as conditions for awarding a State-endorsed diploma, except as provided for seniors entering military or naval service, pursuant to N.J.S.A. 18A:36-17, and handicapped pupils exempted from the requirements. No district board of education may issue a high school diploma without State endorsement.

(f) Review and reporting requirements include the following:

1. Annually, not later than September 30, the chief school administrator shall report at a public meeting to the district board of education and the Commissioner of Education the number of pupils graduated and the number of pupils denied graduation from the prior 12th grade class based on the provision of this chapter. The chief school administrator shall include in the annual report the number of pupils graduated under the special education and special review assessment procedures noted in this subsection;

2. The Commissioner of Education, in accordance with law and rule, shall report to the State Board of Education on the status and outcomes of the promotion and graduation procedures;

3. District boards of education shall submit their graduation requirements on forms provided by the Department of Education to the Commissioner or his or her designee. District boards of education shall update this filed copy as their graduation policies are revised;

4. The Commissioner or his or her designee shall review and approve the district board of education policies and procedures for pupil promotion, remediation, and high school graduation requirements;

5. The Commissioner or his or her designee shall monitor the implementation of the promotion, remediation, and high school graduation policies and procedures; and

6. From time to time, but at least once every five years, the State Board of Education and district boards of education shall review and update their promotion and graduation requirement policies, as a result of the State and local goal review processes noted in N.J.S.A. 18A:7A-8 and N.J.A.C. 6:8-2.3 and 6:8-4.3(a)1i.

Amended by R.1987 d.185, effective April 20, 1987.
See: 19 N.J.R. 4(a), 19 N.J.R. 632(b).
Text added in (c)1i(3) "United States", text added in (c)1i(7) "This requirement may..." and deleted "until August 1988".
Amended by R.1987 d.186, effective April 20, 1987.
See: 19 N.J.R. 4(a), 19 N.J.R. 633(a).
Deleted "Until August, 1988" from (c)1i(6).
Amended by R.1987 d.358, effective September 8, 1987.
See: 19 N.J.R. 1033(b), 19 N.J.R. 1641(c).
Added (a)4; deleted old text from (a)6 and substituted new text.

CHAPTER 39. EVALUATION
SUBCHAPTER 1. STATEWIDE ASSESSMENT

6:39-1.1 Authority of the Commissioner

(a) The Commissioner of Education, with the approval of the State Board of Education, shall conduct an assessment of pupil achievement in the public school system of the State and of any grades therein by such means, tests and examinations which he or she deems proper, and shall report to the State Board the results of such inquiries and such other information with regard thereto as the State Board may require.

(b) All such means, tests, if determined to be appropriate by the Commissioner, and examinations to be administered pursuant to this section shall be conducted by all operating school districts in New Jersey and shall met State criteria.

(c) School districts shall conduct such means, tests, and examinations in the manner and at the times prescribed by the Commissioner.

(d) School districts shall report to the Department of Education the results of such means, tests, and examinations in the manner and at the times prescribed by the Commissioner.

6:39-1.2 Levels of pupil proficiency

(a) The State Board of Education, after consultation with the Commissioner, shall establish uniform statewide levels of pupil proficiency in reading, writing and mathematics skills on the Statewide assessment instruments pursuant to N.J.S.A. 18A:7A-6 and for assessments in those grades required for district certification.

(b) For other grades that are not administered the Statewide assessment instruments and are not considered for district certification, the Department of Education shall establish equivalent standards of pupil proficiency on tests which meet State criteria and measure performance in reading, writing and mathematics skills.

(c) All pupils performing below the established levels of pupil proficiency in reading, writing and mathematics skills, as determined by (a) and (b) above, shall be provided appropriate instructional services according to the district's basic skills improvement plan, pursuant to N.J.S.A. 18A:7A-6.

1. A waiver of this requirement may be granted if the program of needs assessment conducted pursuant to N.J.A.C. 6:8-7.1(b)1 and 4 clearly demonstrated such enrollment is unnecessary as certified by the chief school administrator.

6:39-1.3 Core course proficiencies assessment

(a) The Department of Education shall assess the core course proficiencies established in N.J.A.C. 6:8-7.1(c)2ii. The assessment shall

occur using Statewide tests in the following areas and according to the schedule of administration specified below:

1. Mathematics courses, with tests to be administered in 1993 and reoccur once every four years thereafter.
2. Science courses, with tests to be administered in 1993 and reoccur once every four years thereafter.
3. English courses, with tests to be administered in 1994 and reoccur once every four years thereafter; and
4. Social studies courses, with tests to be administered in 1995 and reoccur once every four years thereafter.

(b) The specific methods and standards for annually assessing student mastery of course proficiencies, as mandated by N.J.A.C. 6:8-7.1(c), shall be the responsibility of each local school district.

(c) The Department of Education shall assist school districts in identifying and/or developing school district assessment techniques and instruments through curriculum panels, prepared assessment material, and regional training activities. The Department shall also identify those school districts that have effective assessment programs which can serve as models.

(d) The Statewide tests will be reviewed as part of the process required in N.J.A.C. 6:8-7.1(c).

(e) A pupil with an educational disability must meet all State and local high school graduation requirements unless exempted in his or her individual education program in order to achieve a State-endorsed high school diploma pursuant to the provisions established under N.J.A.C. 6:28.

6:39-1.4 Dissemination of information

(a) Dissemination of information procedures relative to basic skills proficiency in reading, writing, and mathematics as measured by the High School Proficiency Test (HSPT) and the Early Warning Test (EWT) shall be as follows:

1. Notwithstanding the provisions of N.J.A.C. 6:3-2, individual pupil data shall be released only to a pupil, his or her parent or legal guardian, and school personnel and school officials deemed appropriate by the Commissioner.
2. The Department of Education shall produce and distribute to chief school administrators uninterpreted reports, such as rosters of pupil performance and other reports as deemed appropriate by the Commissioner.
3. Rosters of pupil performance for tests developed by the Department of Education shall be distributed to chief school administrators, as indicated in (a)2 above, in such a manner as to provide a 30-day interpretation period prior to reporting to the district board of education and to the public. Following this 30-day period, the Commissioner shall make available to the public reports about each district which at a minimum shall list the number of pupils tested and percentage of pupils at or above the established levels of pupil proficiency:
   i. By grade and by test for tests developed by the Department; and
   ii. By grade for certain other tests administered by each district, as deemed appropriate by the Commissioner.
4. The Department of Education shall provide an interpreted State report to the State Board of Education.
5. At the time the Commissioner makes available to the public the information stated in (a)3 above, all districts shall make available to the public the number of pupils tested and the percentage of pupils at or above the established levels of pupil proficiency for each school and for the district, by grade and by test.
6. Summary reports for the class(es), school(s), and district shall be distributed to chief school administrators, as indicated in (a)2 above, in such a manner as to provide a 45-day period from receipt of all reports for analysis of data. During this period such material shall not be available for public distribution.
7. Upon completion of the analysis, as indicated in (a)6 above, but in no case later than the 45-day period established by the Commissioner, and upon approval by the district board of education, summary reports for class(es), school(s), and district shall be made available to the public.
8. Individual pupil reports for tests developed by the Department of Education shall be returned to districts in duplicate for all pupils tested. One copy of the report shall be maintained with the pupil's permanent records, and one copy shall be made available to the pupil and his or her parent or legal guardian in a timely fashion.
9. The Commissioner may make exceptions to the above paragraphs, such as those required by the provisions of the Public School Education Act of 1975, N.J.S.A. 18A:7A-1 et seq., as well as special reports requested by school districts.

(b) Dissemination of information procedures relative to the Statewide tests of the core course proficiencies identified in N.J.A.C. 6:39-1.3(a) shall be as follows:

1. Notwithstanding the provisions of N.J.A.C. 6:3-2, individual pupil data shall be released only to the pupil, his or her parent(s) or legal guardian, and school personnel and school officials deemed appropriate by the Commissioner.
2. For those tests developed by the Department of Education, the Department shall provide the chief school administrators with reports of test results. Such reports may include rosters of pupil performance and other reports as deemed appropriate by the Commissioner.
3. The Statewide core course test results shall be returned to the school district by September 1. The Commissioner shall make a public report of the test results by November 1. The report shall include Statewide, school district, and school data.
4. The Department of Education shall provide an interpreted State report to the State Board of Education.
5. All analyses, reports, and assessment compilations for course proficiencies which do not contain personal and identifiable education information shall be considered a public record and shall be made available to the general public upon request.
6. The Commissioner may make exceptions to the above rules, such as those required by the provisions of the Public School Education Act of 1975, N.J.S.A. 18A:7A-1 et seq., as well as special reports requested by school districts.

6:39-1.5 Interpretation of data

(a) The Department of Education will provide technical assistance in the development of essential interpretative material by local districts.

(b) The Department of Education may provide interpretations for local, county and State use.

(c) All results which are made available to the public must be accompanied by interpretative materials.

6:39-1.6 Recognition of excellence

District boards of education shall be encouraged to develop programs which give recognition to students who achieve academic excellence in the course proficiencies.

Appendix B

Early Warning Test scores/Special Edition EWT scores

	EWT/March,1993	Sp.Edition/March,1994
1	29	59
2	31	37
3	32	47
4	38	36
5	41	52
6	34	46
7	24	24
8	24	34
9	19	50
10	17	26
11	26	42
12	31	52
13	37	31
14	26	38
15	27	23
16	35	41
17	31	36
18	28	37
19	37	42

20	33	37
21	18	41
22	25	28
23	33	31
24	32	36
25	27	25
26	19	26
27	22	42
28	32	39
29	33	45
30	16	22
31	17	43
32	27	46
33	26	35
34	32	41
35	23	28
36	32	37
37	25	39
38	30	40
39	28	41
40	30	35
41	32	34
42	30	37

43	28	34
44	31	30
45	33	28
46	28	40
47	31	39
48	31	39
49	32	41
50	36	42
51	26	40
52	18	28
53	22	35
54	27	48
55	33	39
56	27	40
57	42	47
58	25	34
59	32	46
60	31	51
61	31	44
62	26	33
63	34	43
64	33	43
65	31	38

36

66	33	39
67	35	45
68	30	48
69	31	42
70	22	39
71	22	22
72	27	37
73	26	40